

In the Final Office Action, the Examiner rejected claims 14, 15, 21 and 22 under 35 U.S.C. §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter; rejected claim 1 under 35 U.S.C. §102(e) as being anticipated by Chittipeddi (U.S. 2001/0036716 A1); rejected claims 13-15 and 20-22 under 35 U.S.C. §103(a) as being unpatentable over Chittipeddi; and rejected claims 16-19 under 35 U.S.C. §103(a) as being unpatentable over Chittipeddi. Applicants believe the rejection of claims 14-15 and 21-22 under 35 U.S.C. §112 has been overcome by virtue of corrections made to the typographical errors in these claims.

Also, it is Applicants' impression, based on the rejection under 35 U.S.C. §112, that the Examiner may not have considered Applicants' Supplemental Amendment filed on May 20, 2001. A copy of the as-filed Supplemental Amendment is therefore attached hereinwith.

Applicants respectfully traverse the rejections under 35 U.S.C. §§102(e) and 103(a) for the following reasons.

In order to properly anticipate claim 1, Chittipeddi, taken individually, must explicitly or inherently disclose "each and every element as set forth" in the claim of the present invention. (M.P.E.P. 2131, 8th ed. 2001.)

Chittipeddi is in general related to a technique for bonding gold wires to copper metallization in integrated circuits that includes forming a barrier layer on the copper, forming an aluminum bonding pad on the barrier layer, and bonding a gold wire to the aluminum pad.

Claim 1 recites a combination of recitations that includes, among other things, "an intermediate layer formed at least on the Cu film, the intermediate layer comprising

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a TaN film formed on the Cu film and a Ta film formed on the TaN film, wherein a thickness of the TaN film is 20nm or more".

On page 3-4 of the Final Office Action, the Examiner correctly recognized that Chittipeddi "does not show that . . . TaN . . . has a thickness 20nm or 40nm more". In other words, Chittipeddi fails to disclose at least the feature of "a thickness of the TaN film [being] 20nm or more". Therefore, Applicants respectfully request that the rejection of claim 1 under 35 U.S.C. §102(e) be withdrawn.

In making the rejection of claims 13-15 and 20-22 under 35 U.S.C. §103(a) as being unpatentable over Chittipeddi, the Examiner referred to the features of "Ta film [being] 5nm or less or . . . TaN . . . [having] a thickness [of] 20nm or 40nm or more", stating that "it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose these particular dimensions". (Final Office Action, page 3).

Applicants respectfully traverse this rejection, since a *prima facie* case of obviousness has not been made.

Section 2143 of the Manual of Patent Examining Procedure guides examiners in making rejections under 35 U.S.C. § 103(a). According to the Manual, to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), all of three requirements must be met. First, the reference or references, taken alone or in combination, must teach or suggest each and every element recited in the claims. (See M.P.E.P. § 2143.03 (8th ed. 2001).) Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention.

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Third, a reasonable expectation of success must exist. Moreover, each of these requirements must "be found in the prior art, and not be based on applicant's disclosure." (M.P.E.P. § 2143 (8th ed. 2001.)) (Emphasis added.)

Applicants respectfully point out that the Examiner has provided no scientific reason, or basis in the cited prior art, that would motivate one skilled in the art to select the claimed range of thicknesses.

Applicants note that Chittipeddi sets no requirement for the barrier layer other than that "[a] 100-1000 Angstrom layer is suitable" (page 2, paragraph 11), which is a choice of a conventional method. Clearly, Chittipeddi does not require that the barrier layer have any particular property or advantage, such as a low sheet resistance, which is a feature of thickness being chosen within the claimed range in the present invention. (See, for instance, *Fig. 4 or page 15 of the Specification.*) This advantage neither was suggested nor could have been predicted or assumed on the basis of Chittipeddi. Therefore, one skilled in the art would not be motivated to choose a particular number that falls within the claimed range of the present invention.

Furthermore, the fact that a thickness of 100 Angstrom (10nm) for the barrier layer may as well serve the purposes set forth in Chittipeddi's disclosure demonstrates that Chittipeddi actually teaches away from the present invention, since such a choice of thickness would result in a relatively high sheet resistance of the barrier layer.

In view of the above, Chittipeddi fails to teach or suggest every element as recited in claim 1, including at least the feature of "a thickness of the TaN film [being] 20nm or more". Chittipeddi actually teaches away from the present invention. One skilled in the art would not be motivated to make certain choices in practicing Chittipeddi.

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so as to arrive at the present claimed invention. In fact, to arrive at the claimed invention, one would have to rely on the teachings of Applicants' own disclosure, which is impermissible.

Applicants therefore submit that independent claim 1 is allowable under 35 U.S.C. §103 and claims 13 and 15, which depend from claim 1, are also allowable under 35 U.S.C. §103 at least because of their dependency from an allowable base claim. Applicants respectfully request that the rejection of claims 13-15 under 35 U.S.C. §103(a) be withdrawn.

Applicants further respectfully traverse the rejection of claims 16-19 under 35 U.S.C. §103(a) as being unpatentable over Chittipeddi.

First, the Examiner correctly recognized that Chittipeddi fails to disclose a conductive connection member connected to the Al film at the extending portion, as recited in claim 16. Applicants further note that, as clearly shown in the figures of Chittipeddi, whichever shows a bonding wire bonded to the Al film, i.e., Fig. 20 and Fig. 24, the bonding wire is always bonded to a center point of the Al film directly above the Cu metallization layer. Therefore, considering the teachings of Chittipeddi, one skilled in the art would not have the motivation to make such changes so as to arrive at the claimed invention.

As a result, since Chittipeddi fails to teach or suggest each and every element of the claimed invention and there is no motivation for one skilled in the art to make the changes envisioned by the Examiner to Chittipeddi so as to arrive at the claimed invention. It is therefore only through hindsight afforded by Applicants' own disclosure that one skilled in the art can even consider modifying Chittipeddi to arrive at the

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claimed invention. As a result, Applicants submit that a *prima facie* case of obviousness has not been made by the Examiner and respectfully request that the rejection of claims 16 be withdrawn.

Claims 17-22, which depend from claim 16, are therefore also allowable under 35 U.S.C. §103(a) at least because of their dependency from an allowable base claim.

In making the references to the specification and drawings set forth above, it is to be understood that Applicants are in no way intending to limit the scope of the claims to the exemplary embodiments shown in the drawings and described in the specification. Rather, Applicants expressly affirm that they are entitled to have the claims interpreted broadly, to the maximum extent permitted by statute, regulation and applicable case law.

Applicants respectfully request that this Amendment after Final be entered by the Examiner, placing claims 1-13 and 15-22 in condition for allowance. This Amendment after Final should allow for immediate and favorable action by the Examiner. Also, Applicants submit that the entry of this Amendment would place the application in better form for appeal, should the Examiner continue to dispute the patentability of the pending claims. Applicants, therefore, request the entry of this Amendment, the Examiner's reconsideration of the application, and the timely allowance of the pending claims.

Should the Examiner continue to dispute the patentability of the claims after consideration of this Amendment, Applicants invite the Examiner to contact Applicants' representatives by telephone to discuss any remaining issues.

A marked-up version of amended claims is set forth in the attached Appendix.

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Please grant any extensions of time under 37 C.F.R. 1.136 required in entering this response. If there are any fees due under 37. C.F.R. 1.16 or 1.17, which are not enclosed, including any fees required for an extension of time under 37 C.F.R. 1.136, please charge such fees to our deposit account 06-0916.

Respectfully submitted,

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